7.0 Green River, Utah, Disposal Site

7.1 Compliance Summary

The Green River Disposal Site, inspected on March 13, 2003, was in good condition. Erosion had occurred along the cell perimeter road (adjacent to the cell apron) and around the property boundary but posed no threat to the integrity of the cell; the erosion damage was repaired in December. Ground water monitoring continued in 2003 for the purpose of evaluating cell performance, trends in contaminant levels, and the relationship between local precipitation and ground water elevations. No need was identified for a follow-up or contingency inspection.

7.2 Compliance Requirements

Requirements for the long-term surveillance and maintenance of the Green River, Utah, Uranium Mill Tailings Radiation Control Act (UMTRCA) Title I disposal site are specified in the *Long-Term Surveillance Plan for the Green River, Utah, Disposal Site* (DOE/AL/62350–89, Rev. 2, U.S. Department of Energy [DOE], Albuquerque Operations Office, July 1998) and in procedures established by the DOE office at Grand Junction to comply with requirements of Title 10 *Code of Federal Regulations* Part 40.27 (10 CFR 40.27). These requirements are listed in Table 7–1.

Table 7–1. License Requirements for the Green River, Utah, Disposal Site

Requirement	Long-Term Surveillance Plan	This Report
Annual Inspection and Report	Section 6.0	Section 7.3.1
Follow-up or Contingency Inspections	Section 7.0	Section 7.3.2
Routine Maintenance and Repairs	Section 8.0	Section 7.3.3
Ground Water Monitoring	Section 5.2	Section 7.3.4
Corrective Action	Section 9.0	Section 7.3.5

7.3 Compliance Review

7.3.1 Annual Inspection and Report

The site, located southeast of Green River, Utah, was inspected on March 13, 2003. Results of the inspection are described below. Features and photograph locations (PLs) mentioned in this report are shown on Figure 7–1. Numbers in the left margin of this report refer to items summarized in the Executive Summary table.

7.3.1.1 Specific Site Surveillance Features

Access Road, Entrance Gate, and Signs—Access to the site is from a paved public road that leads south from Green River or north from U.S. Interstate Highway 70. Entrance to the site is through a tubular steel gate in the stock fence along the paved road. Past this gate, a short track leads across state land to the disposal cell, which is enclosed within a chain link security fence. The chain link fence is set back 50 to 250 feet from the site boundary. Two vehicle access gates are installed in this fence at the south and east corners of the fence line. A personnel gate is at the north corner of the fence line. The road, fence, and gates were in excellent condition.

The site has one entrance sign and 17 perimeter signs. The signs are on posts set along the unfenced site boundary. Erosion had occurred around the base of two perimeter signs, but the signs were stable and all were in excellent condition.

Site Markers and Monuments—The two granite site markers, 11 boundary monuments, and three survey monuments were in excellent condition. Erosion had occurred around the base of two boundary monuments, but the monuments were stable.

Monitor Wells—The ground water monitoring network consists of four point-of-compliance wells northwest of the disposal cell. An additional well offsite is used for monitoring aquifer water level. These wells were in excellent condition. DOE owns additional wells in the site vicinity (not shown on Figure 7−1) that are used for developing a ground water compliance strategy.

7.3.1.2 Transects

To ensure a thorough and efficient inspection, the site was divided into three areas referred to as transects: (1) the disposal cell and adjacent area inside the security fence; (2) the site perimeter between the security fence and the site boundary; and (3) the outlying area.

Disposal Cell and Adjacent Area Inside the Security Fence—The side and top slopes of the disposal cell are armored with riprap. The riprap was in excellent condition, and there was no evidence of subsidence, differential settlement, slumping, or other modifying process. No plant growth was observed on the cell.

The riprap-filled diversion channel (apron) along the base of the disposal cell on all sides was in excellent condition. Runoff from a storm event in fall 2002 resulted in minor sediment deposition
7A near the south corner of the cell and created two small gullies in the cell perimeter road as the water drained into the apron (PL–1). The erosion did not present a threat to the integrity of the cell; however the gullies were filled and minor site grading was performed to divert runoff water away from the cell apron.

A series of linear cracks running parallel to the northeastern edge of the disposal cell are still present but continue to be filled with wind-blown sediments. The cracks may have been caused by settling of the soils that were backfilled against the cell apron and do not pose a threat to the integrity of the disposal cell or warrant any maintenance action.

DOE installed a precipitation monitoring station in the west corner of the secured portion of the site in September 2001 to evaluate the relationship between site precipitation and ground water elevations. The station was in excellent condition.

Site Perimeter Between the Security Fence and the Site Boundary—Graded areas were reseeded with grasses soon after construction was completed. Establishment of seeded and natural vegetation has been a slow process. Vegetation in these areas continues to be sparse, especially in the graded areas northeast and southwest of the disposal cell. However, natural and seeded plants appear to have reached abundances comparable to the sparsely vegetated surrounding areas and revegetation is considered to be successful.

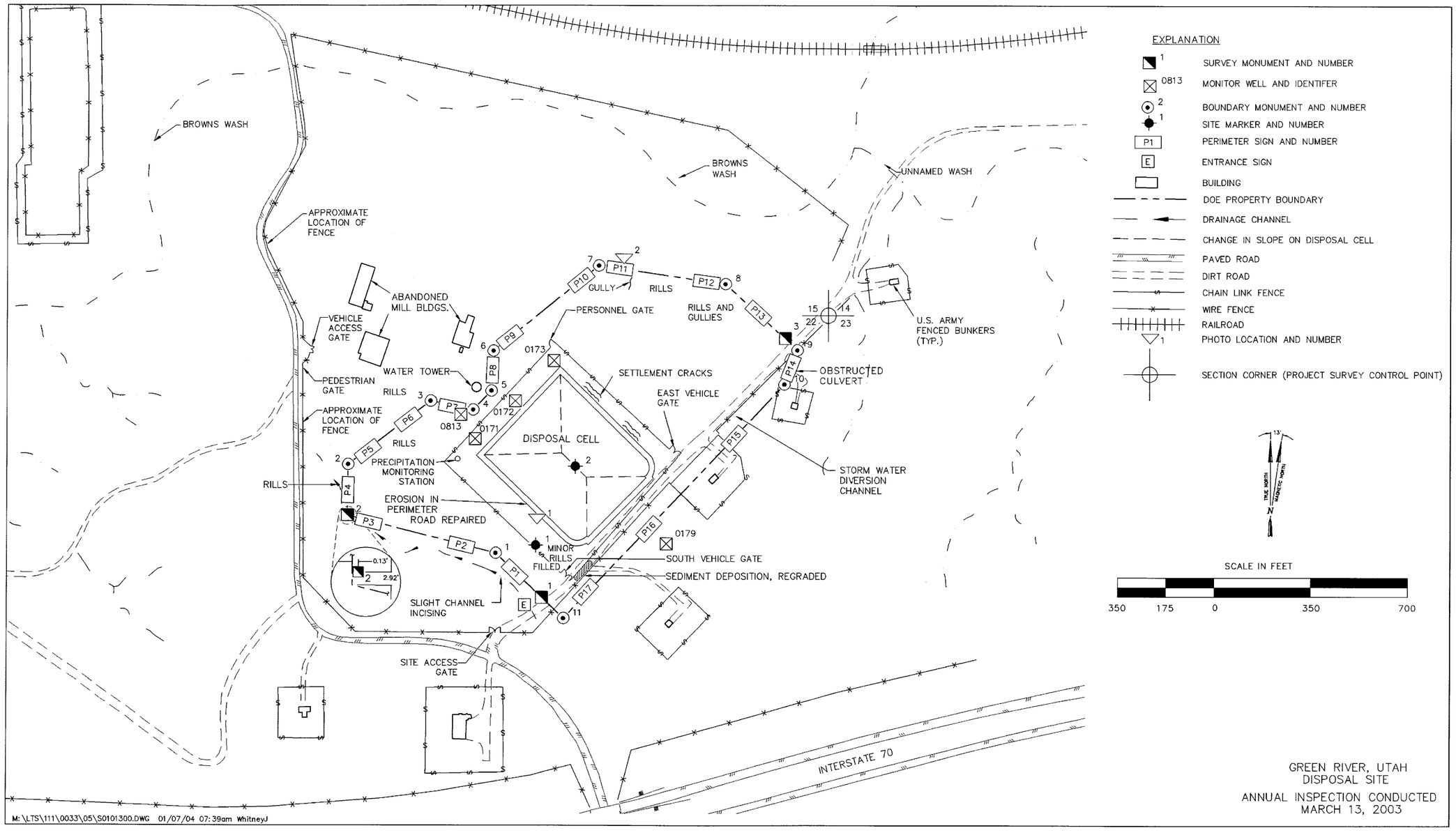

Figure 7–1. 2003 Annual Compliance Drawing for the Green River, Utah, Disposal Site

7B Rill erosion on the west side of the property appears to have increased but does not pose a threat to the integrity of the cell. Site grading was performed to repair erosion damage and to divert runoff away from perimeter sign P4 and boundary monument BM–3.

Rill and gully erosion noted during previous inspections on the hillside northeast of the disposal cell in the area between boundary monument BM–7 and survey monument SM–3 appears to have increased (PL–2). Maximum gully depth in this area is approximately 3 feet. The rill and gully erosion poses no threat to the integrity of the disposal cell but eventually could damage perimeter signs and boundary monuments; therefore, monitoring of erosion in this area will continue.

The entrance to a storm water diversion channel culvert near the northeast corner of the property is completely obstructed with eroded sediments. The culvert underlies an entrance road leading to a locked U.S. Army White Sands Missile Range bunker that is no longer in use. The asphalt entrance road is blocked by a continuous fence (no gate) and is unused and in disrepair. The culvert entrance has a tendency to get obstructed with sediment and dead weeds and has been cleaned out on several occasions. Because the road is blocked and unused, no further maintenance will be performed at this location and runoff will be allowed to flow over the road.

No evidence of trespass on DOE property was noted during the inspection. The barbed-wire stock fence on the surrounding State-owned property provides only minimal security. Inspectors will continue to monitor and record incidents of trespass on the site.

Outlying Area—The area extending outward from the site for a distance of 0.25 mile was checked for signs of erosion, development, or other disturbance that might affect site security or integrity. Areas of erosion noted during this and previous inspections include the natural drainage southwest of the site and rills and gullies northwest of the water tower. These erosional features appear to have increased but pose no threat to the integrity of the disposal cell. However, these areas will be monitored because continued erosion could threaten the stability of perimeter signs or boundary monuments.

The public road from which the site is accessed bends around the southwest corner of the site and continues to the north. The State's barbed and wire fabric stock fence parallels the road. Vehicle and pedestrian gates in this fence west of the site, that allow access to the former millsite buildings and to DOE's unfenced property, were locked.

Abandoned buildings associated with milling activities at the Green River processing site are located northwest of the DOE property. The buildings are in a severe state of disrepair, and debris (e.g., roofing materials, siding, trash) has been blown from the buildings onto DOE property.

7.3.2 Follow-Up or Contingency Inspections

No follow-up or contingency inspections were required in 2003.

7.3.3 Routine Maintenance and Repairs

Minor site grading to divert runoff away from the cell, a perimeter sign, and a boundary monument was performed in 2003.

7.3.4 Ground Water Monitoring

DOE currently is monitoring ground water in four point-of-compliance wells in the uppermost aquifer downgradient from the disposal cell. The purpose of the monitoring is to evaluate the
7C initial performance of the disposal cell. Ground water samples are collected quarterly and analyzed for nitrate, sulfate, and uranium. Proposed concentration limits for these constituents were established in the Long-Term Surveillance Plan and are indicated in Table 7–2. Water levels are measured in the point-of-compliance wells and in off-site well MW−0179.

Table 7–2. Proposed Concentration Limits for Point-of-Compliance Wells at the Green River, Utah, Disposal Site

Monitor Well	Nitrate (as NO_3) (mg/L)	Uranium (mg/L)	Sulfate (mg/L)
MW−0171	44	0.044	3,334
MW−0172	102	0.067	4,985
MW−0173	44	0.044	4,000
MW−0813	44	0.069	4,440

Note: Maximum concentration limits from Table 1 to Subpart A of 40 CFR 192 are 44 milligrams per liter (mg/L) for nitrate (as NO_3) and 0.044 mg/L for uranium. Other proposed concentration limits were determined from background levels for specific wells.

Samples were collected quarterly for 3 years beginning in 1998 with the provision that monitoring requirements would be reevaluated in 2001. An evaluation report, submitted to the U.S. Nuclear Regulatory Commission and the State of Utah in June 2001, concluded that concentrations were within a reasonable range of compliance relative to the proposed concentration limits. Uranium processing-related ground water contamination at the site is being investigated, and it was agreed that monitoring of the four point-of- compliance wells would continue on a quarterly basis until a site-wide compliance strategy and monitoring program is proposed and approved. This effort is nearly completed; in the interim, it has been determined there is no potential impact to human health and the environment as a result of site-related contamination in ground water in the vicinity of the Green River site.

Ground Water Quality Monitoring—Concentrations of nitrate in ground water continued above the proposed concentration limits (Table 7−2) except in well MW−0813, where values were very near the laboratory detection limit (Figure 7–2). Nitrate concentrations fluctuated slightly in well MW−0171, but there was considerable variation in the values for wells MW−0172 and MW−0173.

Sulfate concentrations in ground water have remained relatively constant in wells MW−0171 and MW−0813 since the disposal cell was constructed (Figure 7–3). Concentrations in wells MW−0172 and MW−0173 have fluctuated substantially since 1996. Concentrations in 2003 continued above the proposed concentration limits (Table 7−2) in wells MW−0171, MW−0172, and MW−0173. Sulfate concentration was below the proposed limit in well MW−0813.

Uranium concentrations in ground water were below the proposed concentration limits (Table 7−2) in all four point-of-compliance wells from 1995 until October 2002, when levels exceeded the maximum concentration limit in well MW−0171 (Figure 7–4). The increasing uranium concentration in MW−0171 may be an indication of seepage from the disposal cell, as expected on the basis of the cell design and construction. Concentrations in the other wells remain fairly constant and at or below 0.010 milligrams per liter.

Ground Water Level Monitoring—Ground water levels in several monitor wells adjacent to the disposal cell have been measured manually since 1991, and continually with down-hole dataloggers for the past 5 years. Well hydrographs indicate an overall decrease in the ground water elevation of approximately 4 feet since 1993 (Figure 7–5).

A precipitation monitoring station was installed in the west corner of the secured site in 2001. DOE is evaluating the relationship between precipitation and ground water elevations near the disposal cell to determine if runoff from the cell has an impact on ground water flow at the site, which affects contaminant migration. Based on information collected to date, precipitation has been minimal, and there is no obvious correlation with ground water elevations measured by dataloggers in the wells adjacent to the disposal cell (Figure 7–5).

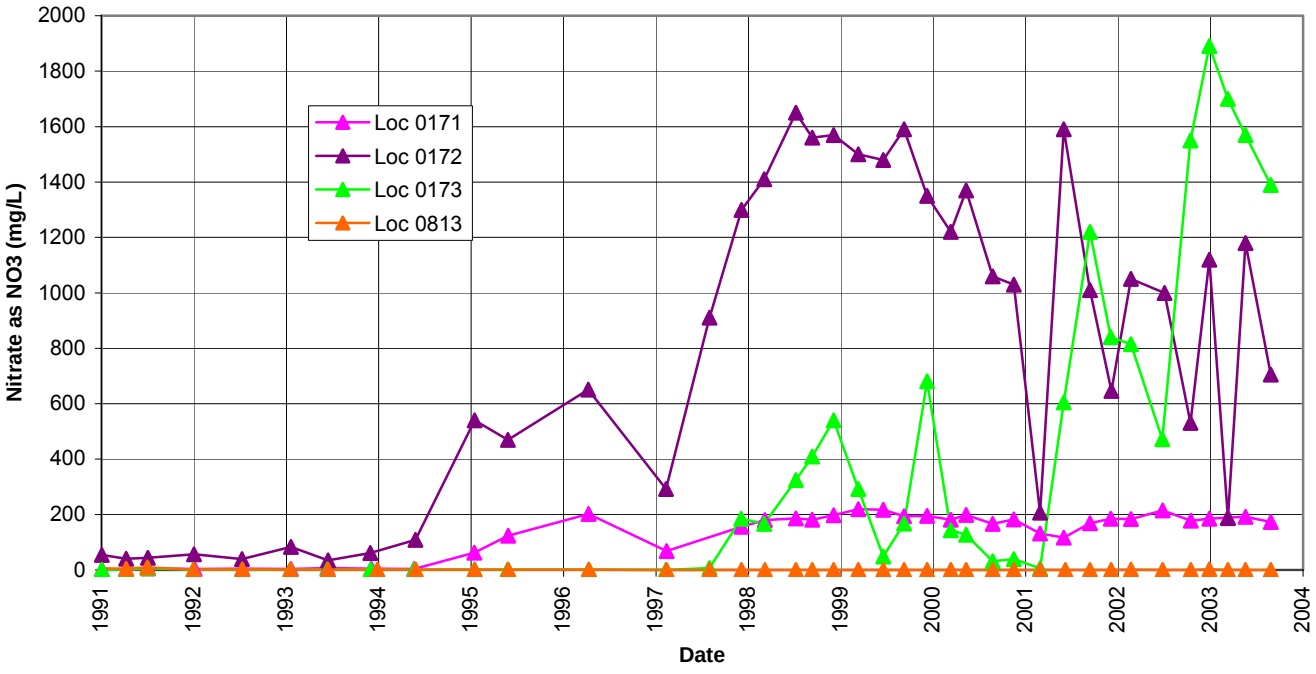

Figure 7−2. Time-Concentration Plots of Nitrate (as NO_3) in Ground Water at the Green River, Utah, Disposal Site

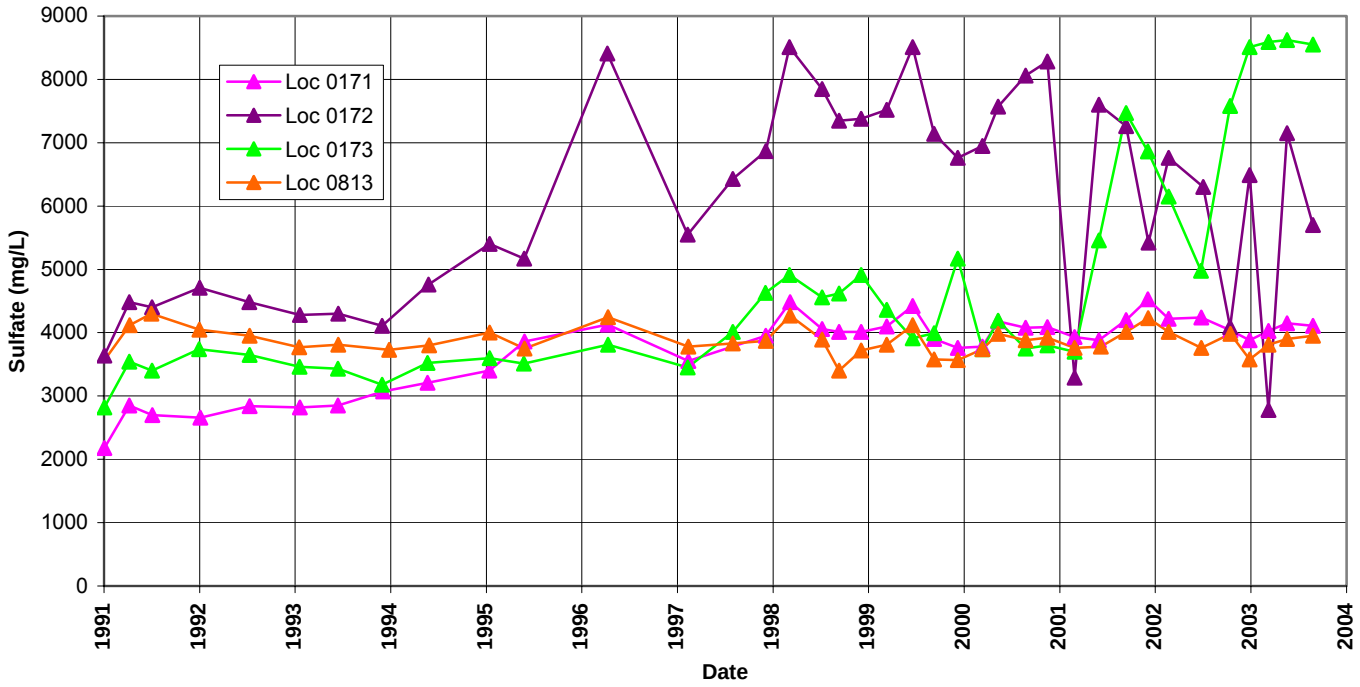

Figure 7−3. Time-Concentration Plots of Sulfate in Ground Water at the Green River, Utah, Disposal Site

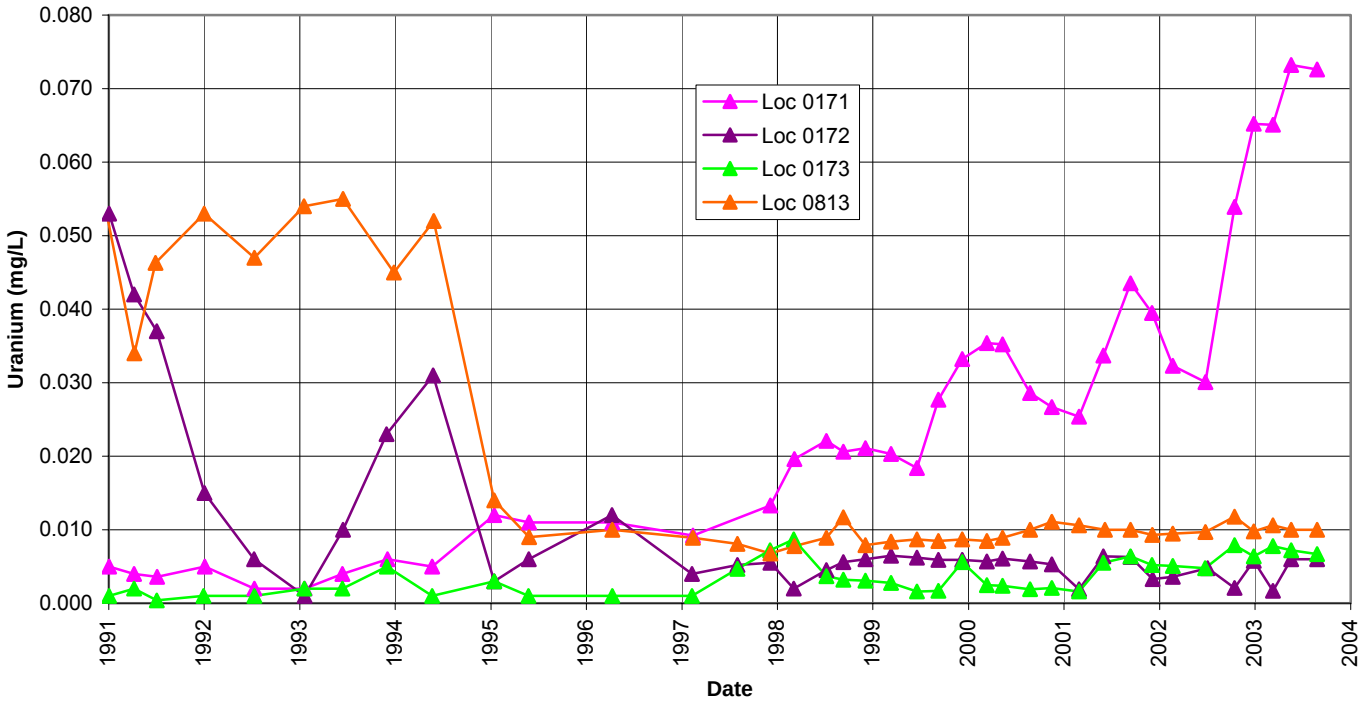

Figure 7−4.Time-Concentration Plots of Uranium in Ground Water at the Green River, Utah, Disposal Site

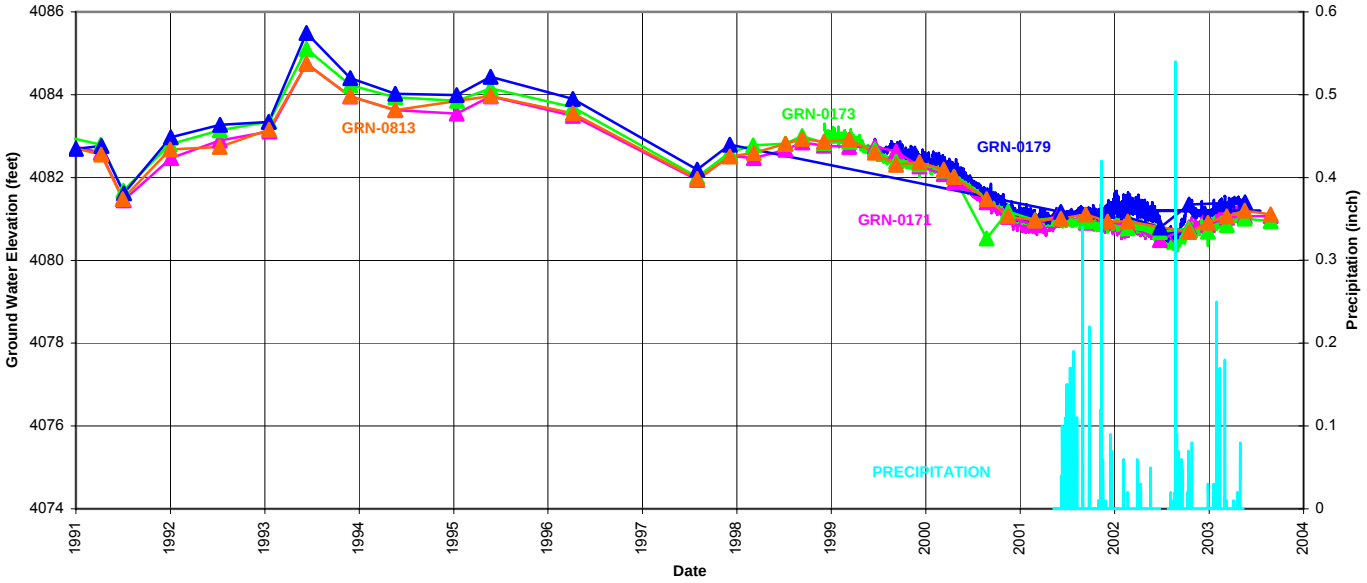

Figure 7−5. Ground Water Elevations and Precipitation at the Green River, Utah, Disposal Site

7.3.5 Corrective Action

Corrective action addresses out-of-compliance or hazardous conditions that create a potential health and safety problem or that may affect the integrity of the disposal cell or compliance with 40 CFR 192.

No corrective action was required in 2003.

7.3.6 Photographs

Table 7–3. Photographs Taken at the Green River, Utah, Disposal Site

Photograph Location Number	Azimuth	Description
PL–1	0	Erosion in the cell perimeter road along the southwest side of the disposal cell.
PL–2	225	Erosion along the north side of the property near perimeter sign P11.

GRN 03/2003. PL–1. Erosion in the cell perimeter road along the southwest side of the disposal cell.

GRN 03/2003. PL–2. Erosion along the north side of the property near perimeter sign P11.

End of current section